

# The Integrator

United States Army Engineer School, Directorate of Environmental Integration

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*DEI representative, Bruce Travis, conducted mobile training at Camp Kim in Area II (Seoul) and Camp Henry in Area IV (Daegu) Korea.*



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## Bring the Experts to You: DEI's Mobile Training Teams

The Government is deploying Army National Guard units at an increasing rate due to the Global War on Terror. Environmental training for many of

these troops heading into contingency operations is a must, but is often lacking. To combat this gap in environmental training, the Directorate of Environmental Integration (DEI) developed its own Mobile Training Teams (MTTs) to travel to the units' sites and provide the training they need. DEI stepped in to quickly and efficiently solve this problem and meet the needs of several deploying units.

DEI's MTTs currently focus on contingency operations that range from pre-deployment to deployment to redeployment and incorporate risk management. As DEI conducts more training sessions, it will be able to identify more specific applications for this focused training and add new topics as necessary for Guard, Reserve, and Active Army personnel.

DEI's MTTs are responsive. This training can be developed and implemented in a short period of time. The training is specifically designed to close the identified gap in training. It is tailored to the unit's needs, and is not just a general overview of current regulations and lessons learned. MTTs are also designed to "train the trainer" so future training needs can be handled by the unit.

DEI has provided mobile trainers to Guard units at Camp Atterbury, Indiana; Fort Stewart, Georgia; Camp



Shelby, Mississippi; and at Fort Benning, Georgia. Bruce Travis, a DEI environmental training specialist, also went to Korea to train active Army personnel in a Korea-specific Environmental Compliance Officer (ECO) training course. DEI's training ranges in duration from two hours to two days. In DEI's training experiences listed above, each location had different needs and DEI's trainers developed and focused the training to meet those specific needs. This flexibility can offer great solutions to training problems.

DEI's mission is to integrate environmental considerations into all doctrine, organizational design, training, materiel development, leadership develop-

ment, personnel and facilities (DOTMLPF) domains. DEI recognizes that quality training tools are essential to meet mission requirements; it has developed effective products and services to make that happen. The MTTs are one example of the DEI's response to developing an effective means of meeting training needs for deploying units. DEI's MTTs will help ensure that required environmental considerations are integrated into contingency operations, therefore helping DEI meet its mission goals. These teams are effective,

focused, and provide a quick response for deploying units.

Although the MTTs are currently focused on deployment needs, they have the flexibility to meet your training needs with training specifically developed for your personnel. Currently, DEI offers this training only if requested. Does your unit need some specific environmental training? Check our website at [www.wood.army.mil/dei](http://www.wood.army.mil/dei) for more information about this service and the many other products that DEI offers.

# FLW Forges Innovative Partnerships with Universities

As the Army works to incorporate new technologies and methods of researching and distributing those technologies, it has made initiatives to partner with universities to take advantage of the mutual benefits these opportunities for partnerships provide. At Fort Leonard Wood (FLW), Missouri a partnership project with enormous potential for the military, universities, contractors, and suppliers is underway. DEI is interested and involved in promoting these partnerships at FLW and other military installations, specifically those that provide solutions to environmental problems.

The concept of military organizations partnering with universities is not a new one. One of many successful partnerships between universities and the military is at Hanscom Air Force Base (AFB) Massachusetts, which has a long standing partnership with the Massachusetts Institute of Technology (MIT) through the MIT Lincoln Laboratory.

According to the Lincoln Laboratory MIT website, it was created in 1951 as a federally-funded research center of MIT, and quickly established a reputation for pioneering advanced electronics in air defense systems. The Laboratory's fundamental mission is to apply science and advanced technology to critical problems of national security. This partnership has benefited both organizations in that it has provided a new venue for much needed research and has given the universities the much needed resources.

FLW is home to the University of Missouri Technology Park in association with the state of Missouri (through the Missouri Enterprise Corporation), and as managing partner, the University of Missouri. The overall mission of this park, according to the University of Missouri, Missouri Research Park



(MRP) website, is to “provide locations on the post to businesses, agencies, and organizations that support or enhance the missions, activities, and strategic goals of Fort Leonard Wood.”

As the Technology Park developed, stakeholders recognized a need for an agent to open the lines of communication between the entities present there. Interested parties have formed the Leonard Wood Institute to promote the activities

and partnerships the Technology Park was created to champion. The Leonard Wood Institute is in the beginning phases, but has goals of bringing organizations together for mutual benefit. Its mission follows: “Leonard Wood Institute develops, promotes and manages world-class government, academic, and

private, business collaborations that have an inherent synergy with Department of Defense missions at FLW.”

The University of Missouri's liaison at the Technology Park is Stephen Tupper. Mr. Tupper works for the University of Missouri Rolla (UMR) at FLW and describes the creation of the Technology Park as “a very bold step...splendid leadership allowed this to happen.” UMR is Missouri's premier technological

research university and is a campus of the University of Missouri so Mr. Tupper represents the University of Missouri's interests through UMR. UMR has a program in which it works with military personnel in the UMR Distance and Continuing Education program helping them to pursue master's-level degrees in a variety of fields (environmental engineering being one of those fields).

UMR has taken a strong environmental stand. It is the only campus in North America and the second in the world to be ISO 14001 certified. ISO 14001 is the cornerstone standard of the ISO 14000 series. It specifies a framework of control for an Environmental Management System (EMS) against which an



*The Technology Park at Fort Leonard Wood has created opportunities for the military, universities, contractors, and suppliers to combine their resources.*

organization can be certified by a third party. This certification exemplifies UMR's desire to be environmentally conscious and trained. UMR's attainment of this standard challenges the military to meet this goal as well. UMR, working with Directorate of Public Work (DPW) on FLW, has made itself available to assist military organizations in working toward the International Organization for Standardization (ISO) 14001 certification.

Another of FLW's partnerships is with Lincoln University. The Department of Defense (DoD) has awarded Lincoln University a three-year \$1.375M grant for the purpose of establishing the Center for Excellence in Environmental Science in cooperation with FLW. The grant has given Lincoln University the opportunity to research topics that will benefit the civilian world as well as the military. Although it is in the beginning phases, some of the research topics include geospatial, water quality, and phytoremediation.

As part of the grant, Lincoln University has opened a liaison office at FLW's Technology Park with Mr. Ollie Jackson acting as the liaison. According to Mr. Jackson, Lincoln University is trying to "look at furthering other partnership projects with the Army and surrounding community." The center will provide "hands-on experience outside of the traditional classroom setting, as well as research opportunities for those students with a concentration in environmental science," according to Lincoln University's website. This partnership provides an excellent opportunity for DEI to take advantage of environmental opportunities as they arise as DEI is part of the advisory board for the Army to help oversee the Army Research Office grant to Lincoln University.

Mr. Jackson expressed Lincoln University's interest in researching products that DEI has helped to promote for use in the Army as well as government agencies. For example, Lincoln University will be researching the possibility of using oil reutilization technology for government vehicles such as police cars (see DEI's spring newsletter for more information on oil reutilization).

Both the UMR and Lincoln University partnerships promote an array of technologies including those with the purpose of increasing environmental awareness and preservation technologies. DEI, located in the Technology Park at FLW, enjoys the benefits of the office and common spaces available there as well as the close proximity to the university liaisons and other organizations. If organizations can use these partnerships to identify needs and opportunities, the military, universities, contractors, and suppliers will benefit.

DEI can bring together the necessary assets to promote environmental issues throughout the military and civilian worlds and the Leonard Wood Institute can help achieve this goal. It can catalog interested organizations, establish commonalities, and organize partnerships among them to promote programs such as the environmental program. Federal agencies, such as the United States Geological Survey (USGS), as well as universities have strong stakes in the environmental program. Some of these agencies need direction with their environmental compliance, EMS, or remediation programs. These partnering universities, have the capability to research and develop products that could eliminate problems and fulfill both training and technological needs. Through this process of synergy between universities and the Army, each need can be united with an organization capable of handling it.



*The reception area at the University of Missouri Tech Park.*

### **The Leonard Wood Institute Mission Objectives**

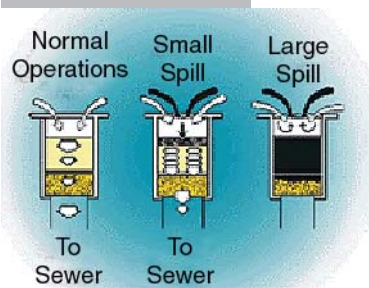
Enable and manage government/academic/industry collaborations in core maneuver support and force protection disciplines that support Joint Operations and Army transformation.

Accelerate technology transfer to and from military and corresponding civilian applications.

Explore other initiatives of value to DoD, Maneuver Support Center (MANSCEN), FLW and other stakeholders.

Expand access to valuable FLW assets.

# Imbiber Beads®: A New Option for Environmental Compliance and Conservation



*The Imbiber Beads® "gravity flow" Drain Protection System (DPS) is illustrated above.*

The Army is constantly seeking new technologies to help meet its environmental goals. One of the issues with which the Army regularly contends is spill cleanup. The Army strives to be prepared to efficiently mitigate spills by using various spill cleanup products and procedures. DEI has recently recognized a technology, called Imbiber Beads® that can give the Army an advantage in this capacity. This article

provides a brief overview of the product.

Imbiber Beads® are cross-linked alkyl styrene polymers which are "engineered" to absorb a broad range of organic chemicals such as gasoline, diesel/jet fuels, transformer oils, chlorinated solvents including trichloroethylene (TCE) and polychlorinated biphenyls (PCBs) as well as polar compounds methyl ethyl ketone (MEK) and methyl isobutyl ketone (MIBK). Produced by Imbibitive Technologies America, Inc. Imbiber Beads® are a pollution prevention, preventative maintenance product that will assist the Army in its efforts to protect the environment and service personnel, and meet environmental compliance standards and requirements in a number of areas.

Imbiber Beads®, as defined by American Society

for Testing Material (ASTM) Performance Standard F726-99 are an absorbent (versus adsorbent), which means the sorbing material actually integrates liquids within its solid molecular structure (rather than on its surface or in its capillaries as an adsorbent would). ASTM states that the absorbing material must "swell" to at least 50% its' original size and contain the liquid so that it cannot be released back into the environment. Imbiber Beads® will swell 200-300% their original size in most military-grade fuels and solvents, picking up many volumes of spilled liquid during the "imbibing" process. The imbibition process eliminates "free liquids" so that Imbiber Beads® can be squeezed, and even cut or shredded but will not release the chemicals they have absorbed. Eliminating free liquids also drastically reduces the rate of hazardous vapor release.

Conversely, adsorbents tend to re-release liquids with simple gravity or compression and cannot pick up more than their own volume of liquid. This increases the risk to both the environment and personnel through secondary liquid contamination and also increases the rate at which dangerous vapors are released. It is the vapors that support combustion and create toxicity concerns when inhaled. (Some examples

## Benefits of Using Imbiber Beads®

- Can be used for a wide variety of active, proactive, and passive pollution prevention applications when organic contaminants must be controlled and contained.
- Can significantly decrease the amount of material needed to control and contain a spill, and reduce the amount of hazardous waste generated.
- Eliminate secondary contamination, which means less required labor, more efficient cleanup, and increased worker safety.
- Reduce direct contact with hazardous spilled products (Imbiber Beads® do not need to be wrung out to recover spilled materials as other adsorbents).
- Reduce the vapor release rate of dangerous and flammable materials by a factor of 5-6 times that of other adsorbent materials.
- Are hydrophobic and unaffected by water, selectively absorbing organic contaminants from water.
- Recyclable as an alternative fuel source in energy recovery processes, lowering disposal costs.
- Reduce the amount of spill recovery products purchased, transported, and stored.
- Reduce the amount of contaminants entering surface water and aquifers as storm water runoff through use of passive drainage control systems.

of adsorbents are polypropylene fibers, cellulosic materials, peat moss, kitty litter, sand, plastic fibers, straw, and porous clays).

Imbiber Beads® have no shelf life and storing them at high temperatures will not affect their performance. In fact, high temperatures lessen the viscosity of liquids, which, in turn, will improve the performance of Imbiber Beads®. Similarly, lower temperatures cause liquids to increase in viscosity, which will slow the absorption process. In the case of gasoline and most military-grade fuels the effect of temperature upon Imbiber Beads®' performance is negligible.

Response experts at the Dow Chemical Company refinery in Freeport, Texas equate one Imbiber Beads® "blanket" as the equivalent of 50 polypropylene pads. Imbiber Beads® blankets cost approximately \$50.

As tiny, plastic spheres that are hydrophobic (will not absorb water), Imbiber Beads® offer the Army an excellent pollution prevention alternative through Imbibitive Technologies', award winning, "gravity-flow" Drain Protection Systems (DPS). Extensive testing and worldwide installation of DPS has demonstrated that Imbiber Beads® will allow water to pass between the tiny spheres, but not contaminants. When fuels or solvents come into contact with Imbiber Beads® they swell to the point that they choke off the void spaces between the spherical particles, effectively "sealing the leak path". The DPS provides the Army with a positive shut-off mechanism, which has no moving parts, requires no electricity or electronic sensors and eliminates the human error factor, which is the number one cause of environmental incidents.

Imbiber Beads® spill and preventive maintenance products include booms, blankets, pillows, and packets. Some of the applications for Imbiber Beads® follow:

- Hazardous Material (HAZMAT) Emergency Response involving organic chemical spills or releases.
- Proactive "Point Source Control" drainage control for watershed/waterway protection. Imbiber Beads® are ideal for use in point source control, and can help keep spills from reaching areas where they can contaminate the ground or waterways.
- Spill prevention and containment of Petroleum, Oil, and Lubricants (POLs) during preventative maintenance activities in repair shops, flight lines, and motor pools.

- Passive routine maintenance roles such as sheen control in manholes, sumps, outfalls, or on open water surfaces.

Imbiber Beads® will benefit most installations in places such as auto craft shops, unit motor pools, and where drain systems are at risk. Imbiber Beads® are also excellent options for contingency operations. They are lightweight and compact, making them easy to transport compared to adsorbent products such as cat litter or sawdust.

Purchasing Imbiber Beads will help an organization meet the affirmative procurement requirements of Executive Order (EO) 13101, which requires executive agencies to incorporate waste prevention and recycling in their daily operations. Imbibed liquids may also be recycled as a high yield "energy from waste" (fuel blending) alternative.

Another example is using Imbiber Beads® gravity flow DPS. These drain systems will prevent POL from entering drains or leaving a facility and help organizations meet their Spill Prevention, Control and Countermeasure (SPCC) requirements for storm water runoff best management practices (BMPs). In both direct and indirect ways, Imbiber Beads® would be a good purchase for many installations and contingency operations.

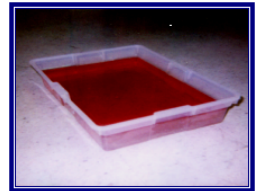
Imbiber Beads® have been recognized by and received recognition from organizations:

- The United Nations and the Tech Museum of Innovation recognized Imbiber Beads® for their contribution to protecting the environment.
- Imbiber Beads® were a finalist for the 2003 Tech Museum Awards for its Imbiber Beads® DPS.
- Imbiber Beads® were nominated by the Environmental Engineering Department at Pope Air Force Base, North Carolina for "The White House – Closing the Circle Award" under the category of "Environmental Innovation" in 1998.

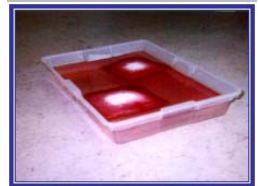
Seeking out and bringing attention to technologies such as Imbiber Beads® will help Army agencies find ways to integrate methods of complying with laws and regulations while carrying out daily activities. For more information on Imbiber Beads®, visit Imbibitive Technologies at its website: [www.imbiberbeads.com](http://www.imbiberbeads.com) ■

Photographs reproduced with permission of Imbibitive Technologies America, Inc.

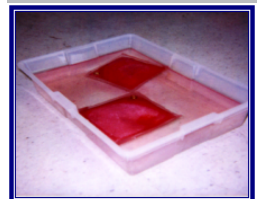
*These photographs illustrate the progression of Imbiber Beads® packets imbibing the diesel fuel in this basin.*



*Time Elapsed: 0 minutes  
Basin of water with 2 pints of diesel fuel (tinted red)*



*Time Elapsed: 1 minute  
Basin of Water with 2 7x7 inch Imbiber Beads® Packets.*



*Time Elapsed: 6 minutes*



*Time Elapsed: 15 minutes  
2 pints of diesel fuel fully absorbed into the 2 Imbiber Beads® packets*

# Doing the Dirty Work: DEI Works to Improve the Environmental Training at Combat Training Centers



*DEI's observations revealed problems with hazardous waste disposal.*

As troops move into the desert to establish a forward operating basecamp (FOB) they choose a site, bring in equipment, and the camp begins to take shape. During operations, a piece of equipment hits a 55-gallon container of hazardous material and it begins to leak.

Fortunately, this scenario takes place at Ft. Irwin and the installation can provide the environmental support for the situation. What if this scenario had taken place in a different "desert"?

These situations require spill response procedures. Soldiers must be trained to follow those procedures and respond to situations such as the one described above. Three centers exist to train today's Army troops in realistic environments. The three centers are the National Training Center (NTC) at Ft. Irwin, CA that provides desert training; the Joint Readiness Training Center (JRTC) at Ft. Polk, LA that provides rotational units the opportunity to conduct joint operations emphasizing contingency force missions; and the Combat Maneuver Training Center (CMTC) located at Hohenfels, Germany that provides joint, combined, North Atlantic Treaty Organization (NATO), and Service Component training in a forward deployed environment.

These centers train infantry brigade task forces and their subordinate elements. The training is realistic, stressful, and provides joint arms training on all aspects of conflict, both current and future. Each center provides a different type of training.

Surveys from contingency operations identified shortcomings in integrating environmental considerations in base camp operations. In deployed hostile situations, combat expediency is to be expected. However, once a camp is established to provide support, Soldiers inhabiting the base camp should follow prescribed procedures for addressing environ-

mental issues. DEI began to investigate why Soldiers were not following procedures in those situations.

DEI determined the best way to identify and evaluate the problems would be to observe actual training exercises and preparations and instruction associated with exercises. DEI personnel observed operations and noted issues that would require conducting future additional training or incorporating environmental considerations into existing training. DEI also looked for any impacts of regulatory restrictions on the training exercises. DEI determined that the shortcomings could have been due to lack of unit training, command oversight, orders communication and dissemination, equipment/material availability, or

## DEI's Focus Areas

- Impact of regulatory restrictions on training.
- Operations "work-arounds" to environmental restrictions.
- Unit operation protocols to respond to environmental issues or threats.
- Are environmental threats or incidents worked into training scenarios?
- What support is provided by the installation hosting the training?
- How do rotational units address environmental threats/issues?
- What are the lessons learned from the rotations?
- How is the environmental cleanup team utilized?
- Types of wastes resulting from a rotation.

lack of consistent management approach.

DEI has observed exercises at NTC and plans to attend training exercises at CMTC and JRTC. DEI also attends the after action review briefings to gain insight into issues taking place during the exercises.

By observing “actual” operations (through realistic training), DEI can begin to identify areas lacking environmental considerations and develop training scenarios to include in future training cycles. DEI’s observations have also helped identify persistent problems that can be corrected with proper training and support.

Their observations of areas needing additional training or integration include:

- Improper waste disposal problems, including HAZMAT, hazardous waste (HAZWASTE), and medical waste
- No environmental officers or waste managers during the observed rotation
- No spill response capability
- No satellite accumulation points (SAPs) to accept HAZWASTE for storage at each site where the waste was generated
- Improper solid waste disposal. *Note: Improper solid waste disposal will attract*



*vermin and other vectors to the site that can potentially harm personnel*

- No cleanup exercises incorporated into the training. *Note: The hosting installation provided all the cleanup expertise. However, these personnel will not deploy with the unit so each rotation should include actual spill response and cleanup exercises to enable personnel in contingency operations will be prepared to respond.*

The opportunity for DEI to observe realistic and combat training provided an invaluable way to identify areas that need further training or support. Personnel training in simulated contingency operations will gain valuable experience to take with them to actual contingency base camps. Integrating environmental considerations into this training will provide the experience Soldier’s need to handle situations that will occur during operations.

Integrating environmental considerations into the overall basecamp training will ensure that they become a part of the planning process. Implementing these considerations into the planning process will help ensure they safely and appropriately handle and store material. DEI has the resources to help the Army integrate environmental considerations into all aspects of DOTMLPF operations. Visit DEI’s website for further information. ■

*Leaking barrels located in a cardboard box are liable to cause contamination.*



*Improperly stored boxes can leak.*

# Options for Complying with the Army's HAZMIN Policy: Antifreeze Recycling



*The photograph above is a BE Series Engine Coolant Recycler by Finish-Thompson Inc.*

As the Army works toward eliminating pollution in its various forms, it investigates many recycling possibilities in an effort to achieve higher environmental standards.

EO 12856 requires the Army to improve recycling and reduce waste generation. In response to this order, the Army set a goal to reduce ethylene glycol waste by 100 percent. The Army's ethylene glycol waste stream comes almost entirely from

antifreeze and ethylene glycol is the primary component of antifreeze. Antifreeze recycling is an efficient and environmentally sound means to this end.

Waste antifreeze may be considered to be HAZWASTE in some states because of the toxicity of the ethylene glycol component, the toxicity of the products of degradation/oxidation of ethylene glycol, and/or the heavy metals content. Because disposing of HAZWASTE is expensive and can be harmful to the environment, the Army has begun to take avenues other than disposal to deal with antifreeze. Antifreeze recycling has become a viable option for disposing of used antifreeze.

The Army has researched, identified, and approved a few antifreeze recycling systems for Army vehicles. The DoD-approved antifreeze recycling systems use ion exchange and vacuum distillation as the primary separation/purification processes. The approved systems filter solids from the spent antifreeze, and remove the metal ion contaminants from the solution. The recovered coolant solution often requires blending with an inhibitor package to restore it to its initial state. These systems work with either ethylene

glycol or propylene glycol. They are fairly simple to operate and are portable.

The United States Army Environmental Center (USAEC) arranged the testing of two antifreeze recycling systems at four Army installations. The one-year test resulted in the government approving the use of both the K. Fawley Manufacturing Corporation Cool'r Clean'r Coolant Purification System (now known as the KFM Coolant Purification System) and the Finish Thompson BE-55C Coolant Reclaimer System. As part of the test, system users were trained to use the necessary and proper equipment by representatives from the respective companies. Each installation had specified vehicles to test the effectiveness of the recycling.

The distillation system produces the larger quantity of waste residue of the two systems. The tested system is the BE-Series Coolant Reclaimer System. It operates as a vacuum distillation unit and processes waste coolant at a flow rate of between 1-3.2 gallons per hour. It produces approximately three gallons of residue per 75 gallons of spent antifreeze. The residue may be hazardous waste since the lead contamination is often greater than 5 parts per million (ppm).

The dual resin bed ion exchange system removes all dissolved solids from the used antifreeze and combines with the multi-stage filtration to remove the suspended solids. The coolant is processed at up to 180 gallons per hour and once processed, the waste coolant returns to pure ethylene glycol and deionized water. Spent filters accumulate metals and must be considered hazardous waste when disposed. The resins, however, are generally shipped back to the manufacturer and regenerated.

If you choose to recycle your spent antifreeze, you have some options to consider. You can recycle onsite, offsite, or hire a mobile recycling service. If you choose to recycle antifreeze onsite, you will need to purchase a recycling system such as those described above. Offsite recycling involves transporting the spent antifreeze to a facility that recycles the antifreeze for you. The other option is a mobile recycling service that will travel to where you are and recycle the antifreeze onsite.

The costs of recycling will vary depending on

whether you choose to recycle onsite or offsite as well as the amounts of antifreeze you use. Offsite recycling will be more expensive in the long run but you would not need to make the initial capital investment to do it.

Antifreeze recycling is more economical than disposal according to The Pollution Prevention Equipment Program for the Navy Environmental Leadership Program (NELP) preproduction initiative performed at Naval Station Mayport for an 18-gallon antifreeze-recycling unit. See the example cost comparison on this page.

The Army has published a users guide for recycling military antifreeze. This document, the *Antifreeze Recycling User's Guide, RDECOM March 2005*, indicates that deionization units, specifically Cool'r Clean'r® unit distributed by K. Fawley Manufacturing, and distillation units, specifically those manufactured by Finish Thompson Inc., will efficiently recycle antifreeze.

For more information on the two antifreeze recyclers discussed in this article contact the vendors directly at the contact information provided here.

Finish-Thompson Inc.  
Email: [fti@finishthompson.com](mailto:fti@finishthompson.com)  
Website: [www.finishthompson.com](http://www.finishthompson.com)  
Phone: 814-455-4478  
FAX: 814-455-8518

KFM LLC  
FAX: 864-224-6601  
Contact: Glen Van Romer  
Email: [info@kfmlc.com](mailto:info@kfmlc.com)  
Cage Code: 1KES0

Photographs reproduced with permission of Finish Thompson Inc., and KFM LLC.



*The photograph to the left is the Coolant Purification System made by KFM LLC.*

The following economic analysis comes from The Pollution Prevention Equipment Program for a Navy Environmental Leadership Program (NELP) production initiative performed at Naval Station Mayport for the annual cost benefits of using an 18-gallon antifreeze-recycling unit (costs will vary depending on the amount of antifreeze you will need):

#### Antifreeze Recycling Assumptions:

- Cost of fresh antifreeze: \$4.77/gallon
- 63.9 gallons of antifreeze required per year without the antifreeze recycling unit
- 3.99 gallons of fresh antifreeze required per year using the antifreeze recycling unit
- Cost of glyclean extender required for recycling unit \$96.08/year
- Cost of standard 10 pH buffer solution required for recycling unit: \$12.70/year
- Disposal labor requirements: 30 hours
- Recycling labor requirements: 45 hours
- Labor: \$10.39
- Pounds of waste fluid for disposal: 1,181.1
- Pounds of contaminated rags/year for disposal and recycling methods: 5-8
- Waste fluid and contaminated rag disposal cost: \$2.10 pounds

	Recycling	Disposal
<b>Operational Costs:</b>		
Labor	\$467	\$311
Material	\$128	\$302
Waste Disposal	\$16	\$2,497
Total Operational Costs	\$611	\$3,111
Total Recovered Income	\$0	\$0
<b>Net Annual Cost/Benefit</b>	<b>-\$611</b>	<b>-\$3,111</b>

# Products and Services

United States Army Engineer School, Directorate of Environmental Integration



## DEI's Role in the Army's Transformation

In 2001, DEI published the Army Environmental Integration Plan (AEIP), outlining the past, present, and future of environmental integration into Army operations. Since that time, numerous changes have impacted how the Army views environmental considerations. These changes include the publishing of the 2004

Army Strategy for the Environment; the increased demands for environmental support to contingency operations brought on by the Global War on Terrorism; new doctrine, organization, and equipment changes as a result of Transformation; and changes to the Army environmental agency and program

architecture.

As the Army moves from a compliance based to a sustainment based environmental program, it is more crucial than ever that environmental considerations be integrated into planning and operations from the outset. Integrating these

considerations early and developing an environmental ethic similar to the safety ethic that has been ingrained in Soldiers over the last several years, will enable the Army to perform its mission with greater regard for the environment. By developing Soldier and leader training programs, DEI will increase the skills and environmental awareness of the Army's personnel.

While the focus of the Army environmental program has been on permanent installations and training lands, the increase in contingency operations,

coupled with the increased awareness of the global environment, has necessitated the further integration of environmental considerations into contingency operations. Soldier health, the protection of environmental and cultural resources in the host nation, fiscal responsibility, protection against liability, and good public perceptions are all crucial to successful operations. DEI will support this important area by integrating environmental considerations into emerging doctrine, researching best management practices, and conducting field survey and mobile training team operations.

As the Army moves through the Transformation process, it is developing new doctrine, organizations, and equipment. DEI is ensuring that this potential opportunity to integrate environmental considerations at the "ground floor" is not lost. By integrating environmental considerations into doctrine and training and researching and developing new products, DEI is working to ensure that the Army develops the best practices to protect the Soldier and the environment.

To accomplish this broad mission, DEI is reviewing the AEIP using the Joint Capabilities Integration and Development System (JCIDS) as a model. This task analysis will identify capability gaps in the ability to support the environmental mission and potential solutions for further study and implementation.

This process will result in a strategic plan for DEI that focuses its efforts in the coming years. DEI will continue to be the Army's lead agency for integrating environmental considerations across all DOTMLPF domains, with the focus on concerns that directly affect the Soldier, the unit, and our Army.

### To Subscribe to this Newsletter

To receive this letter via email, please contact Mr. John Cooper at the Directorate of Environmental Integration (DEI). Phone 573-329-1931 or visit the DEI website at <http://www.wood.army.mil/dei/DEIContacts1.asp>

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DEI Newsletter



All requests for information from the US Army Engineer School (USAES), to include environmental questions, should be directed to the following RFI (Request for Information) System:

[https://www.wood.army.mil/rfi\\_manager/](https://www.wood.army.mil/rfi_manager/)